



BRITISH BROADCASTING CORPORATION

MICROCOMPUTER SYSTEM

Prestel System USER GUIDE



The Prestel User Guide

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WARNING: THE PRESTEL ADAPTER MUST BE EARTHED

Important: The wires in the mains lead for the Prestel Adapter are coloured in accordance with the following code:

Green and yellow	Earth
Blue	Neutral
Brown	Live

As the colours of the wires may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked by the letter E, or by the safety earth symbol 4- or coloured green, or green and yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N, or coloured black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L, or coloured red.

If the socket outlet available is not suitable for the plug supplied, the plug should be cut off and the appropriate plug fitted and wired as previously noted. The moulded plug which was cut off must be disposed of as it would be a potential shock hazard if it were to be plugged in with the cut off end of the mains cord exposed. The moulded plug must be used with the fuse and fuse carrier firmly in place. The fuse carrier is of the same basic colour* as the coloured insert in the base of the plug. Different manufacturers' plugs and fuse carriers are not interchangeable. In the event of loss of the fuse carrier, the moulded plug **MUST NOT** be used. Either replace the moulded plug with another conventional plug wired as previously described, or obtain a replacement fuse carrier from an authorised BBC Microcomputer dealer. In the event of the fuse blowing it should be replaced, after clearing any faults, with a 3 amp fuse that is ASTA approved to BS1362.

* Not necessarily the same shade of that colour.

Within this publication the term BBC is used as an abbreviation for British Broadcasting Corporation.

Exposure

Like most electronic equipment, the Prestel Adapter should not be exposed to direct sunlight or moisture for long periods.

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1 Introduction

This User Guide explains how the BBC Microcomputer and Prestel Adapter can be used as a very versatile Prestel terminal. For those of you who are not familiar with the BBC Microcomputer, it is a good idea to get used to the keyboard before using the Prestel Adapter, and to keep the *BBC Microcomputer System User Guide* close at hand.

The Prestel Adapter software will work with any filing system compatible with the BBC Microcomputer, but for convenience's sake only discs are referred to in this User Guide.

The different typefaces used

You will notice that some letters, words and phrases in this manual have been printed differently from the rest of the text. This is to help you to tell the difference between explanatory text, words which appear on the screen and certain keys on the computer keyboard.

- Ordinary text appears like this, or *like this* for emphasis.
- Text typed in at the computer or displayed on the screen appears like this.
- Words like **RETURN** mean that you press the key marked RETURN rather than actually type the letters R E T U R N.

What is Prestel?

If you are new to the British Telecom Prestel system, here is a brief introduction. Once you are a registered Prestel user, full details of the service and facilities are sent to you, as well as the information available on Prestel about itself.

Prestel is a very large computerised information service available via the public telephone system. This information (news, weather, share prices, travel etc) is stored on a number of Prestel computers at various locations throughout the country. Each computer is connected to a telephone exchange and is allocated a telephone number which can be dialled by Prestel subscribers. As well as providing information on request, subscribers can send information via their terminal to the Prestel computer.

How Prestel information is organised

Because of the wide variety of information available, related items of information are grouped together to allow for logical access. Information is sent from the Prestel computer to the terminal as Teletext characters (MODE 7 on the BBC Microcomputer). To make it easy to read, Prestel information is sent in screenfuls, and each screenful is called a 'frame'.

The frames are numbered from 0a, b, c ... to 999999999a, b, c ... Each topic is allotted a frame number, eg 6789a. If the topic needs to occupy more than one frame, then it continues on 6789b, 6789c and so on.

There are thousands of Prestel frames, electronically linked together to form a structure which makes it quick and easy to locate a frame containing specific information.

The Prestel monthly user's magazine gives a complete index of all information items and the frames on which each can be found, but bear in mind that frequent changes occur.

The Prestel Adapter facilities in brief

These are as follows:

- Prestel frames can be selected directly by frame number, or through the Prestel-prompted menus.
- Frames can be stepped through in either direction.
- Frames can be 'tagged', so that important frames can be returned to without having to remember the frame number.
- Frames containing programs (called telesoftware) which will run on the BBC Microcomputer can be downloaded from Prestel, recognised as programs rather than ordinary text data, and saved to disc or cassette.
- Messages can be sent to other Prestel users via the Prestel 'mailbox' facility. Messages can be sent immediately, or can be built up whilst disconnected from the Prestel computer. The Prestel Adapter has a comprehensive editor which allows the user to generate text and graphics in different colours, and to define his own graphics characters.
- The red function keys can be programmed to hold text and commands (without affecting their normal use as command keys when running the Prestel Adapter software).

All the features provided by the BT Prestel service for two-way communication (like booking airline tickets etc) are available on the Prestel Adapter.

BT Gold

There is another British Telecom information system available via telephone called BT Gold. The Prestel Adapter may be used to access this service, and the Adapter must be 'reconfigured' slightly to do so. Contact British Telecom for full details on BT Gold, and refer to chapter 6 for the relevant configuration commands.

2 Getting started

Checklist of items

When you unpack the system, make sure you have the following items:

- A Prestel ROM integrated circuit
- A Prestel subscriber's application form.
- A Prestel Adapter unit
- A guarantee registration card.
- A voucher entitling you to a series 1 operating system ROM.
- A Prestel 'ruler' for inserting underneath the clear plastic strip on your BBC Microcomputer.

Your telephone system

Your telephone must be an exclusive service (not on a shared or 'party' line). It must be connected to the public telephone lines by means of the new type white plastic plug/socket connection. If it is not, contact your local telephone sales office and arrange to have one fitted.

Registering as a Prestel user

Fill in the application form and post it to the address shown. While you are waiting for a reply, you can connect up the units as described in the next section, and check out the system. (If you need any help filling out the application form, consult your dealer.)

You will receive by post (separately for security reasons) a user's identification number and a personal password. You need these to identify yourself to Prestel and without them you cannot use Prestel.

Take care of these codes — anyone else who knows them can use Prestel and the charges will go on your account.

Prestel allows you to change your personal password whenever you like (but not your identification number). We recommend you do this as soon as you are a registered Prestel user just in case someone else has both your number and password. For details on how to change your password see chapter 3.

In addition to the codes, you will receive the latest Prestel user's monthly magazine and any other relevant literature put out by Prestel for that month.

Installing the system and checking it out

The first thing to do is check that your BBC Microcomputer is fitted with the correct machine operating system (MOS) ROM. It is possible that if you've had your computer for some time, the MOS is an early issue and therefore not suitable, in which case it will have to be replaced.

To check the MOS ROM, connect up the computer and the television (or video monitor) as described in chapter 1 of the *BBC Microcomputer System User Guide*. Switch on the computer and monitor and check that the following message, or something similar, is displayed on the screen.

```
BBC Computer 32K
```

```
BASIC
```

```
> _
```

Now type in

```
*FX0 RETURN
```

This will cause 0S1.20 (or similar numbers) to be displayed on the screen. This is the version of the operating system you are currently using. If this number is 1.0 or greater, then the MOS is suitable for Prestel. If the MOS issue number is less than 1.0 then it will have to be replaced — take your BBC Microcomputer and the voucher which comes with the Prestel Adapter to your nearest dealer, who will instal a new MOS ROM for you free of charge.

Fitting the Prestel ROM

If you feel confident of your ability to fit the Prestel ROM, then refer to Appendix A which explains what must be done. Otherwise, consult your nearest dealer, who will help you.

Once the Prestel ROM has been fitted, connect up the complete system as shown in figure 1. If possible, connect the BBC Microcomputer and the Prestel Adapter to adjacent electrical sockets.

Switch on the BBC Microcomputer, television/monitor and Prestel Adapter. The on/off switch for the Prestel Adapter is at the rear of the unit.

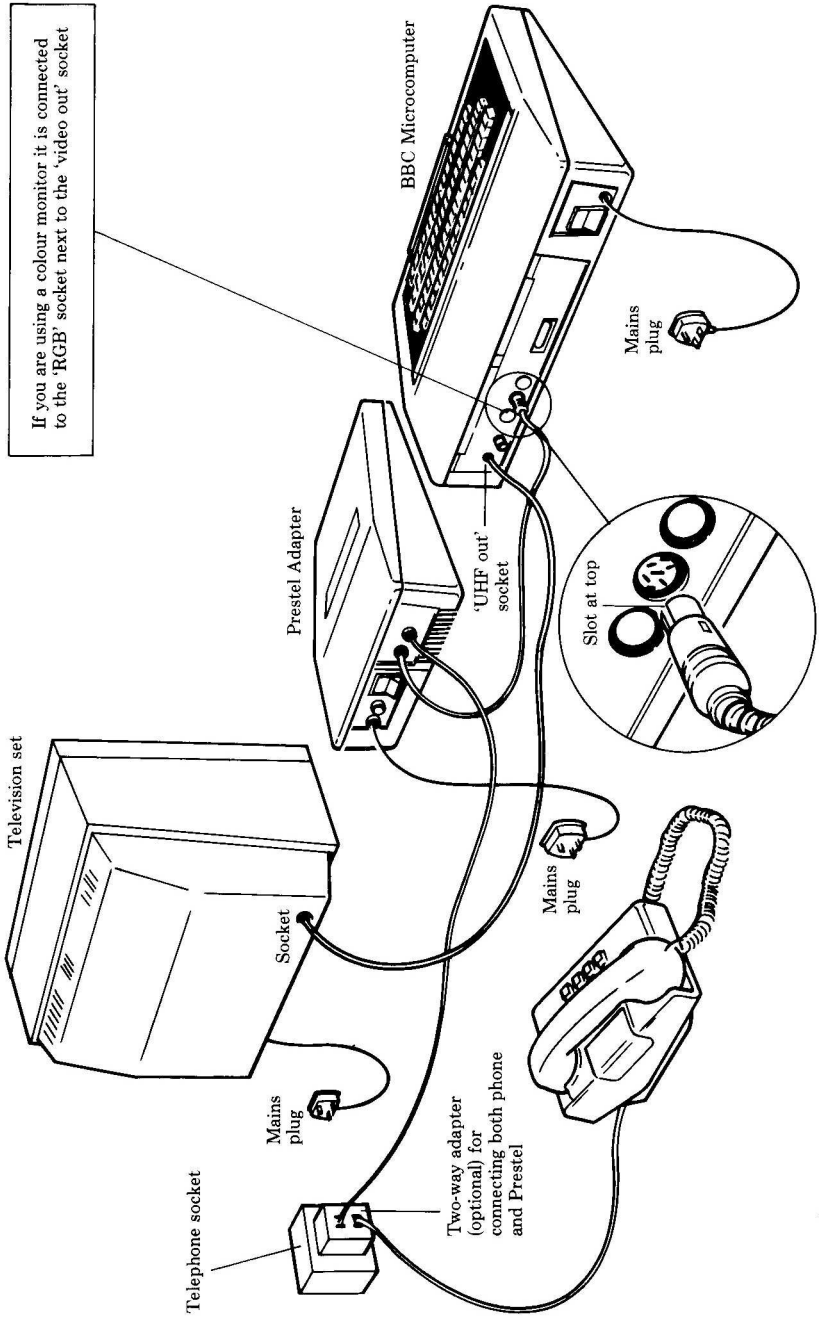


Figure 1

Check that the correct message is displayed as shown previously, then type in

```
*HELP      RETURN
```

to confirm that the MOS ROM is correct and the Prestel ROM is listed as one of the systems fitted.

Lastly, lift up the clear plastic strip above the red function keys on your BBC Microcomputer, and insert the Prestel ruler so that the command legends on the ruler line up with the ten function keys.

This completes the installation and checkout procedure and the system is now ready to be used as a Prestel terminal.

Starting up the Prestel software

Irrespective of the current language, type

```
*PRESTEL   RETURN
```

or

```
*P.        RETURN
```

A Prestel message will appear on the screen together with the message `Offline`. This tells you that the Prestel program is running in your BBC Microcomputer, but your system is not yet connected to the Prestel computer.

Caution: When not using Prestel, switch off the Prestel Adapter at the rear (on/ off switch) to avoid the possibility of incurring excessive telephone charges.

The Prestel software you are now running has given the red function keys on the BBC Microcomputer special meanings, so that you can use them to give commands to the Prestel system. These commands are the ones on the strip you inserted above the function keys.

As well as these commands, you can also type in commands using the normal keyboard. Both kinds of commands are explained in detail in the next chapter.

3 Using the BBC Microcomputer Prestel system

Introduction

This chapter lists and describes each of the Prestel commands, produced either by a function key or otherwise.

The Prestel commands

From now on, the commands above the red function keys will be referred to by name rather than by their associated function key number. For example:

- **SEND** rather than **SHIFT f3**.
- **LEAVE** rather than f4.

Note: Please refer to chapter 5 for an explanation of the **MENU** and **PAUSE** commands. Refer to chapter 6 for details of the **CONFIG** commands.

Selecting the 'help' menu

HELP (f0)

The 'help' menu is a display generated by the Prestel terminal software to show you what each function key does. Some keys have more than one function depending on how the terminal is being used on Prestel and the 'help' menu lists the different functions for each key. To select the 'help' menu:

Press the **HELP** key.

To remove the 'help' menu and restore your previous display, press any other key.

Making operating system calls

O.S.COMMAND (fl)

With this command you can use any of the normal BBC Microcomputer * commands without leaving Prestel or going off-line.

Press the **O.S.COMMAND** key to enter the operating system then use the commands as normal (see *BBC Microcomputer System User Guide* chapters 41 and 42).

Remember that for as long as theOnline message is displayed, your telephone account is growing. Also, if you have left the Prestel software while still on-line to the Prestel computer – for example by typing

O. S.COMMAND BASIC RETURN

– the Prestel Adapter is still connected to the Prestel computer, and is costing you money!

Calling up Prestel

CALL (f3)

The most important command at this stage is **CALL** Prestel (done by using the **f3** function key).

To call Prestel, press

CALL RETURN

The messages `Call` and `Enter` or `Return` will appear.

Now type in the phone number of the Prestel computer you wish to use.

Notes

- The characters `*`, `+`, `-` : can be used as separators between digits. They cause a small (800 millisecond) delay which often helps to ensure the connection is made first time.
- If your system is connected to a local PABX, ie you first have to enter 9 or some other number to get an outside line, you must type in `/` after the 9, eg `9 / <phone number>`. The `/` character initiates a delay of four seconds which gives the PABX time to pick up an outside line before your system dials the Prestel number.
- If your PABX system uses a new type of internal line (typified by musical tones heard when dialling a number), then you will have to use the telephone to dial the number in the normal way instead of keying in the number at the keyboard. Ignore the rest of this section and read the next section.

Now press **RETURN** (to enter the number).

After a short time the message `Dialling` will appear. This tells you that your system is in the process of being connected to the telephone line. If you do not hear a dialling tone press **ESCAPE** and start again. After about four seconds, the number you entered (including separator characters) will appear on the screen, telling you that dialling is taking place.

Next, the message `Waiting` appears, telling you that dialling has finished and the system is waiting to be connected to Prestel.

When the connection is made, you will hear a high pitched tone over the Prestel Adapter loudspeaker. A second or two later the message `Online` replaces `Call` and the `Welcome` message is displayed together with a message telling you to enter your Prestel identification number.

Calling from the 'musical tone' internal line

- Press **CALL RETURN**.
- Pick up the handset and dial the Prestel number.
- Listen until you are connected to the Prestel computer (a high pitched tone). Now press **RETURN** again.
- Replace the handset - and read on.

Entering your identification number and password

Now type in your identification number carefully to avoid making mistakes. For security reasons, each number you type in is displayed as a -.

Prestel will respond with a message telling you to enter your personal password. Now type in your password, making sure that you don't make any mistakes or the Prestel computer will reject your password. *Don't press **RETURN** after typing in your password.*

Almost immediately a **Hello** message with your name and address will be displayed confirming that Prestel has recognised your identification and password. Also the message **Online** is displayed indicating your terminal is connected to Prestel.

Note: Remember that your identification number and password represent a combination unique to you. If anyone else gets hold of the combination and uses it, all expenses will be charged to your Prestel account! For this reason, it is a good idea to change your password regularly. To do this, select frame 920 by typing in ***920#**. You will then see instructions on how to change your password.

Problems you may encounter whilst getting started

When you type in the Prestel phone number the message **Adapter ?** will appear if you forgot to switch on or plug in the Prestel Adapter. If this happens, press **ESCAPE**, plug in and switch on the Prestel Adapter and start again by pressing **CALL**. Also check that you have connected the RS423C lead from the Prestel Adapter to the BBC Microcomputer.

If after entering the Prestel phone number the dialling tone cannot be heard, press **ESCAPE** and start again by pressing **CALL**. Do this a few times before assuming there is a fault.

If there is still no dialling tone, make sure the Adapter is properly plugged in to the phone socket, then unplug the Prestel Adapter and plug in the telephone. Now check for the dialling tone on the telephone.

When the dialling has ended and the message `Waiting` is displayed, if after 90 seconds the connection is not made, the Prestel Adapter is switched off-line by your computer. Alternatively, if all lines to the Prestel computer are engaged, the engaged tone will sound and the system will go off-line after 90 seconds. In both cases the message `No reply` appears, and you must then press **ESCAPE** and start again with **CALL**. On hearing the engaged tone, you may press **ESCAPE** at any time to abandon the call.

Caution: Remember to leave Prestel in the correct way (via **LEAVE** or **HOLD**) as soon as you have finished with it. If you do not, you could incur excessive telephone and Prestel charges.

Selecting a frame

***<frame number> #**

As explained earlier, Prestel information is split up into screenfuls of text, or 'frames'. Now that you are connected to a Prestel computer, if you want to see some particular information, there are two ways of calling it up onto your monitor.

Either you can follow the menus displayed by Prestel, or, if you know the exact frame number of the information you require, you can select it as described below. The main advantage of doing it this way is that you don't have to go through the sometimes laborious task of wading through menu after menu offered by Prestel to get to the frame you require.

To select a frame by number, type in

***< frame number> #**

The frame will then be displayed.

Notes

If you select a non-existent frame number or type in more than nine digits, the **Mistake** message is displayed. If you type in a character other than a number it will be ignored by the computer.

Irrespective of how many frames are stored in Prestel under the number you have selected, you will always get the first or 'a' frame. If you do try to type in a letter after the number it will be ignored by the computer.

Selecting the next frame

or RETURN

This command only works if there is more than one frame under the same frame number. It allows you to quickly select the next frame in the alphabetic sequence. For example, if the currently displayed frame is 243b and you type in #, the next frame (243c) will be displayed. To select the next frame:

Press the # key.

Alternatively, press **RETURN**.

Selecting the previous frame

← or *#

This command causes the currently displayed frame to be replaced by the previously displayed frame. You can use this command up to three times to display the three most recently displayed frames.

Press the ← key.

Alternatively, type in *#.

Selecting the main index frame

↑ or *0#

This command allows you to return quickly to the main index frame. To display the main index frame:

Press the ↑ key or select frame 0 with *0#.

Requesting a duplicate frame

COPY or *00

This command is useful if a frame you have requested becomes corrupted. If this happens you can request a copy free of charge and as many times as you wish. To request a copy:

Press the **COPY** key.

Alternatively: type ***00**.

Requesting an update on a frame **SHIFT**

COPY or *09

Some frames contain information which frequently changes, for example aircraft arrival and departure times. These frames are known as update frames. You will know whether or not a frame is updated because the index frame on which it is listed will carry a message to that effect together with the charge for each update requested. To request an update:

Press the **SHIFT COPY** keys together.

Alternatively, type in *09.

The frame will be reselected and displayed.

Notes

Because you have selected an update, it does not necessarily mean that the frame sent back will contain new information — it depends on how often updating takes place in the Prestel computer.

Saving a frame

SAVE FRAME (f8)

You can save any displayed frame by simply pressing the **SAVE FRAME** key. The computer now has to create a filename which is derived from the frame number.

If the frame number is seven characters or less, this becomes the filename. If the frame number is more than seven characters, then the computer retains the first five numbers and the letter, then adds another letter of its own (derived from the unused digits). This becomes the filename of the frame to be saved.

The message *Save* is now displayed and you can confirm that you wish to save the frame or program by pressing **RETURN** in the usual way.

If you want to change the filename, type in the new name now, then press **RETURN**, otherwise only press **RETURN**.

The frame is now saved.

Loading a frame

LOAD FRAME (f6)

A frame which has been already saved onto disc can be loaded back again using the **LOAD FRAME** key. This is useful for editing message frames, or simply for getting information whilst not on-line to Prestel (and incurring charges).

Type

LOAD FRAME RETURN

followed by the frame's filename, and press **RETURN**. The frame is loaded into the BBC Microcomputer and displayed on the screen.

Printing a frame

PRINT FRAME (f9)

This command allows you to obtain a printout of the displayed frame.

If your printer is fitted with a Centronics interface (this is a printer which is connected to the 'printer' socket on the computer), then obtaining a print of a frame is simply a matter of pressing the **PRINT FRAME** key.

If however your printer is of the serial type (connected to the RS423C socket on the computer) then you must save the frame to be printed first, disconnect the Prestel Adapter, which uses the RS423C socket, then connect the printer:

Save the frame to file, using the **SAVE FRAME** key.

Leave Prestel via the **LEAVE** or **HOLD** keys.

Switch off the Prestel Adapter and disconnect it from the RS423C socket

Connect the printer to the RS423C socket on the computer and switch it on.

Load the frame from file using the **LOAD FRAME** key.

Press the **PRINT FRAME** key to print the frame.

Frame tagging

SHIFT ↑ ↓ ← →

While searching through Prestel for information, there may be instances when you want to go back to a previously displayed frame but can't remember its number! Frame tagging is a useful facility which enables you to put 'tags' on a number of important frames you may wish to return to without having to remember their numbers.

You can tag any frame (including a response or message frame) and although there is a limit to how many you can tag, it's unlikely you will exceed this limit. In the event that you do tag more frames than the system will allow, the first tag will be overwritten by the most recent, and so on.

When a frame is tagged, its number and order of tagging (first, second etc) are saved in the computer memory. You can select the frame tagged immediately before or immediately after the frame currently displayed. This allows you to move up or down the list of tagged frames, displaying each one in turn until you see the frame you want.

Once a frame is tagged it will remain so until the computer is switched off or the tag is overwritten.

To tag the current frame

Press **SHIFT** ↓

The frame number will flash to indicate the frame is now tagged.

To display a frame tagged after the current frame

Press **SHIFT** →

To display a frame tagged before the current frame

Press **SHIFT** ←

You can also make any tagged frame the 'most recently tagged' frame, in other words the frame which will be immediately displayed when you tag backwards or forwards. To do this, display the frame you want then press **SHIFT** ↑.

Holding a frame and leaving Prestel

HOLD
(SHIFT f4)

This command disconnects your system from Prestel and retains the last displayed frame on your screen. *Do not use this command unless you wish to leave Prestel.* To hold a frame:

Press **HOLD RETURN**

Notes

Once you have used this command you will have to go through the **CALL** routine to get back on-line. This does allow you to view a frame off-line without incurring telephone charges.

Revealing and concealing information

**SHIFT
DELETE**

Some frames are sent with concealed information which requires a specific command from your computer to reveal this information. Generally a frame with concealed information carries the message `Press Reveal` to indicate this.

To reveal information press **SHIFT DELETE**.

To reconceal the information press **SHIFT DELETE** again.

Sending messages

One of the features of Prestel is MAILBOX which enables you to send messages to any other Prestel users. To send a message you must know the destination which in this case is the mailbox number of the recipient. A message can only be sent on a mailbox frame which you select in the same way as any other frame. Currently, message frames are on frame 77. Once you have selected the message frame, type in the message and the intended recipient's mailbox number, then send the message.

There are two ways in which you can build a message and send it via 'mailbox'.

You can select a blank message frame (frame 77a), type in your message and send it whilst your terminal is connected to Prestel (on-line).

You can save a blank message frame to a file, then type in the message on the blank frame whilst off-line and only call Prestel when you wish to send the message. This can save you spending more time than necessary on-line and thus incurring more charges than you need to.

Sending a message on-line

Make sure your terminal is connected to Prestel then select frame 77 a by typing in *77#. A blank message frame will appear and you will also see a small white editing cursor which indicates that you have a text editor facility for typing and editing a message. The cursor indicates the point where you can type in characters and in addition you can use the following keys:

- ↑ – Move cursor up
- ↓ – Move cursor down
- – Move cursor right
- ← – Move cursor left

RETURN– Move the cursor to the beginning of the current line. Note that this differs from the usual function of the **RETURN** key which sends the character # to Prestel.

The **DELETE** key removes the character previously typed.

Note that when a message frame is displayed on-line to the Prestel computer, the cursor keys are released from their usual functions of frame tagging, and moving to adjacent frames. This is known as 'cursor on' mode.

When the message frame is first displayed, all it contains is your mailbox number and a # which terminates the recipients' mailbox numbers. The cursor is already positioned correctly, so all you have to do is type in the mailbox number of whoever the message is intended for and end it by typing #. The cursor will then move to the message area of the frame and the name of whoever the message is intended for will appear under the mailbox number.

Next, type in your message (the cursor is again correctly positioned at the start of message area, so all you have to do is start typing). You must end the message with the character # otherwise the message will not be sent.

Note

Do not put more spaces than you need to in the message. This will keep the actual sending time to a minimum since every character (including spaces) is sent.

When you have ended the message with #, the cursor moves quickly to the end of the frame and the message

KEY 1 TO SEND KEY 2 NOT TO SEND

is displayed. This tells you that the message has been sent to Prestel but has not yet been put in the mailbox.

Type in 1 or 2 as required.

Preparing a message off-line

This method of sending messages uses the same cursor controls as above. The difference is that you can build up a message off-line on a blank message frame, then load the message into the computer and send it. The following is an example of how you might use this method:

- Call up Prestel and select frame 77 to display a blank message frame.
- Save the frame to disc by using the **SAVE FRAME** key.
- Leave Prestel (ie go off-line) using the **LEAVE** key.
- Load the blank frame from file using the **LOAD FRAME** key.
- Enter Edit mode using the **EDIT FRAME** key. You will see the flashing cursor and you have exactly the same cursor controls as described in 'Sending a message on-line'.
- This time, however, the cursor will *not* be automatically positioned (as it was previously), so you must use the $\uparrow \downarrow \leftarrow \rightarrow$ keys to position it directly under the first digit of your mailbox number. Then type in the recipient's mailbox number.

Position the cursor (anywhere) on the same line as the prompt > then type in the message and end it with # as before.

Now press **ESCAPE**. The messages `Save and Return or Escape` will appear. Press **RETURN**, and if you wish to change the filename you can do so by simply typing in the new filename. Now press **RETURN** and the frame will be saved to disc.

When you want to send the message you have just saved, call Prestel, select frame 77 and load your message from file using the **LOAD FRAME** key. The message you load will appear in the message frame, ready to send.

Now press the **SEND** key. As each character is sent to Prestel, you will see the cursor move slowly through the message until it finally reaches # after which it will quickly move to the end of the frame.

Sending a message to more than one mailbox CTRL COPY

If you wish to send the same message to a number of mailboxes, you don't need to retype the message each time — all you have to do is change the mailbox number.

Let's assume you have just sent a message and this has been confirmed by the message `Sent` being displayed on the screen. If you now press the **CTRL COPY** keys, the message will reappear with the cursor correctly positioned.

Next, type in the new mailbox number followed by # and the cursor will move to the start of the message area.

Now type in # and the cursor will move through the message in the usual way.

Finally, key in 1 (to send) or 2 (not to send).

Note

Having copied a message frame you can of course edit it before sending by using the **EDIT FRAME** key. When you have finished editing, press **RETURN** to move the cursor back to the message, then type in #. Finally, key in 1 or 2 as normal.

Downloading a telesoftware program

D/LOAD PROGRAM (f5)

Prestel provides a software service for different computers, including the BBC Microcomputer. Each program occupies a number of frames, and the Prestel Adapter provides the facilities of downloading the chosen program into the BBC Microcomputer's memory, and saving it onto disc.

When you have selected the program you want, the first or a' frame is displayed. The next thing to do is locate the frame which contains the program header (usually the 'c' frame) and you can do this by pressing **RETURN**. You will recognise the header frame as it will show a message which reads `Press F5 to download or something similar`.

Now press **D/LOAD PROGRAM**

The message `Downloading` will appear and the complete program will load into the computer frame by frame.

You can press **ESCAPE** at any time to stop downloading. The program already in memory will stay there but if you wish to load the rest of the program you must start again from the beginning.

When downloading is complete the message `Downloaded Save file is displayed`. You can now, if you wish, save the downloaded program to disc.

To do this, first press **RETURN**. A name under which the program will be saved will appear in the bottom left corner. If you want to file the program under another name, all you have to do is type in the new name and press **RETURN**. The program will now be filed under your new name. Now press **RETURN**, and the program will be saved.

Problems you may encounter

In the event that one of the frames being downloaded contains corrupt data, the system detects this and attempts to download the frame again. It will do this three times, but if the frame is still corrupt the message `Return or Escape is displayed`. If you press **RETURN** the system will attempt to download the frame again—you can do this as many times as you like. If you press **ESCAPE** the download will be abandoned and the main index frame will be displayed.

If an error occurs during saving, eg disc fault, press **ESCAPE**. This takes the machine out of the filing sequence. However the program is still in memory so you can still save it by using the standard **SAVE PROGRAM** routine.

If the message `No room` appears, this means the computer memory has been filled up before the program is completely downloaded.

Saving a telesoftware program

SAVE PROGRAM (SHIFT 5)

To save a successfully downloaded Prestel telesoftware program onto disc or cassette, first select the file parameters (for the disc filing system only— see the *Disc Filing System User Guide*. DFS commands start with a * which is generated within Prestel by the **O.S.COMMAND** key).

Press **SAVE PROGRAM**.

The program is now saved onto disc or cassette.

4 Edit mode in detail

The Edit mode allows the user to generate `MODE 7` text and graphics primarily for sending messages via the 'mailbox' facility (see chapter 3). To see some of these features, make sure that the Adapter is off-line, then press the **EDIT FRAME** key, and press **RETURN**.

Simple editing keys

As you type characters at the keyboard, they appear at the current cursor position. The cursor control keys move the cursor around the screen; the **DELETE** key allows editing of any characters on the screen; the **RETURN** key sends the cursor to the beginning of the current line; **CTRL L** 'homes' the cursor to the top left of the screen.

Once in Edit mode, the red function keys now control the Teletext mode features.

Editing text

SHIFT f1 to **f9** provide the following:

SHIFT f0	(nothing)
SHIFT f1	Alpha red
SHIFT f2	Alpha green
SHIFT f3	Alpha yellow
SHIFT f4	Alpha blue
SHIFT f5	Alpha magenta
SHIFT f6	Alpha cyan
SHIFT f7	Alpha white
SHIFT f8	Flashing
SHIFT f9	Steady

Examples

Type the following:

SHIFT f1This is red text**SHIFT f8**which is now flashing

Remember that **SHIFT f1** actually occupies a character position on the screen, so if you typed in a space immediately after pressing **f1** or after the final

t in text and so on, you will have one too many spaces. Go back to the space, say, after the final t in text, and delete it. If you delete the **SHIFT f1** character, then

This is red text

will revert to the default colour which is white.

Note that the colour-change characters **SHIFT f1** to **f9** only work up to the end of the current line. As soon as a new line is started on the screen, text displayed reverts to white again.

Editing graphics

There are two ways of producing graphics. One way is to use the graphics characters produced by the keyboard, the other — and far quicker — way is to make up your own graphics characters as you need them.

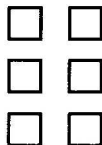
Both ways depend on keying in a graphics control character first Graphics control characters are generated by **CTRL f1** to **f9**.

CTRL f1 to **f9** provide the following:

CTRL f0	(nothing)
CTRL f1	Graphics red
CTRL f2	Graphics green
CTRL f3	Graphics yellow
CTRL f4	Graphics blue
CTRL f5	Graphics magenta
CTRL f6	Graphics cyan
CTRL f7	Graphics white
CTRL f8	Conceal
CTRL f9	Put graphics (copy user-designed graphics character to cursor)

Graphics produced from keyboard characters

Each keyboard character can be made to display a shape on the screen, and this shape is made out of a six by two matrix of squares.



If you aren't familiar with the Teletext graphics character set, turn to the back of the *BBC Microcomputer System User Guide*, where you will find two charts, one called

Teletext (MODE 7) Displayed Alphanumeric Characters

and the other called

Teletext (MODE 7) Displayed Graphic Characters

If you look at these two charts, you can work out the corresponding graphics character to each of the black keys on the BBC Microcomputer keyboard.

For example, to produce a checked pattern in white, type in the following:

CTRL f1 (selects graphics red)

Now use the graphics character from the table, number 57. This corresponds to the number '9' in the alphanumeric table.

Press the '9' key on the keyboard repeatedly. Instead of the number nine appearing on the screen, a check pattern appears, in red.

Note that if the graphics characters spill over to the next line, the graphics parameters you set up on the line above have to be typed in again (ie **CTRL f1** in the example above). If you don't type in **CTRL f1** again, the number nine will be displayed as a '9' again.

Making your own graphics characters

In the bottom left-hand corner of the screen is the six by two matrix representing a graphics character. To build the character you want, you use either of two sets of keys in either upper or lower case:

Q	W	O	P
A	S	L	;
Z	X	.	/

To edit the matrix, hold down the **SHIFT LOCK** key and press six keys in one of the sets above. You'll notice that the six segments 'switch' on and off when you continuously press the six keys.

When you have built the character you want, and wish to place it at the cursor, first of all key in a graphics control character (CTRL f1 to f7), then press

SHIFT LOCK COPY

or

CTRL f9

The new character is then copied to the cursor position.

There are ten more miscellaneous commands which are accessed by **CTRL SHIFT f0** to **f9**.

CTRL SHIFT f0	End edit (ends editing when editing on-line to Prestel)
CTRL SHIFT f1	Double height
CTRL SHIFT f2	Single height
CTRL SHIFT f3	Separated graphics (smaller segments – space between segments)
CTRL SHIFT f4	Contiguous graphics (adjacent segments touch)
CTRL SHIFT f5	Hold graphics (see notes below)
CTRL SHIFT f6	Release graphics (see notes below)
CTRL SHIFT f7	Conceal graphics (conceals graphics characters on current line)
CTRL SHIFT f8	Black background
CTRL SHIFT f9	New background (sets background colour to current text colour)

Note: 'Hold graphics' allows a consequent graphics character to be repeated (on the same line) in different colours, without colour-change spaces between characters. The repeats are generated by the colour-change function keys **CTRL f—**. 'Release graphics' resets the 'Hold graphics' facility.

Leaving the Edit mode, and saving the screen to disc

To leave the Edit mode, press **ESCAPE**. The message `Save` appears; if you wish eventually to send or print the screen you have created, press **RETURN**, and if no filename is displayed, type in a suitable name.

Press **RETURN** again.

If you simply want to leave the Edit mode without saving anything, then press **ESCAPE** twice.

Printing the screen

To obtain a printout of the screen produced in Edit mode, press **ESCAPE**, save the screen, press **RETURN** again, then press **PRINT FRAME**. If you have a serial rather than parallel printer, please see 'Printing a frame' in chapter 3.

Note: The printer will reproduce graphics characters as asterisks.

5 Using the function keys to store strings

The function keys **f0** to **f9** can be used to store combinations of text, graphics and commands. Bearing in mind that these keys can hold Prestel commands (also on function keys), the result of executing a programmed function key will depend on whether you are in 'normal' or Edit mode. For example, if the programmed function key contains ; F D, then in 'normal' mode, this is executed as the **HOLD** function. In Edit mode, | F D will initialise blue text.

Once programmed, the function keys **f0** to **f9** are accessed by pressing **f0** to **f9** in Edit mode, and **CTRL f0** to **f9** in 'normal' mode.

Storing text, graphics and commands in Edit mode

The **SHIFT** function, **CTRL** function and **CTRL SHIFT** function key commands can be stored in **f0** to **f9** as follows:

SHIFT f0	(nothing)	F@
SHIFT f1	Alpha red	FA
SHIFT f2	Alpha green	FB
SHIFT f3	Alpha yellow	FC
SHIFT f4	Alpha blue	FD
SHIFT f5	Alpha magenta	FE
SHIFT f6	Alpha cyan	FF
SHIFT f7	Alpha white	FG
SHIFT f8	Flashing	FH
SHIFT f9	Steady	FI
CTRL f0	(nothing)	FP
CTRL f1	Graphics red	FQ
CTRL f2	Graphics green	FR
CTRL f3	Graphics yellow	FS
CTRL f4	Graphics blue	FT
CTRL f5	Graphics magenta	FU
CTRL f6	Graphics cyan	FV
CTRL f7	Graphics white	FW
CTRL f8	Conceal	FX
CTRL f9	Put graphics	FY

CTRL SHIFT f0	End edit	F_
CTRL SHIFT f1	Double height	Fa
CTRL SHIFT f2	Single height	Fb
CTRL SHIFT f3	Separated graphics	Fc
CTRL SHIFT f4	Contiguous graphics	Fd
CTRL SHIFT f5	Hold graphics	Fe
CTRL SHIFT f6	Release graphics	Ff
CTRL SHIFT f7	Conceal graphics	Fg
CTRL SHIFT f8	Black background	Fh
CTRL SHIFT f9	New background	Fi

Example

Type in the following

SHIFT f1 This is red text**SHIFT f8**which is now flashing

This could be stored in, say, **f5** as follows:

```
*KEY5    "|FAThis is red text|FHwhich is now flashing"
```

On returning to Edit mode, and pressing **f5**, the text will appear in red and flashing red as before.

Creating BOOT frames and the MENU key

Not only can frames of text and graphics be produced in the Edit mode (see chapter 4), but commands can be incorporated and executed as well. This means that a frame can contain operating system commands and Prestel commands, typed in as text; saved onto disc; loaded back at a later stage, and the frame searched for commands which can then be executed.

This frame searching and command execution is done by the **MENU** function.

Inserting command lines into a frame

First, press

EDIT FRAME RETURN

A command is keyed in by starting with **SHIFT RETURN** P followed by either a * or a digit from 0 to 9.

The * signifies that what follows is an operating system command, and a digit signifies that what follows is a string to be held by the function key of that number.

The command is terminated by **SHIFT RETURN X**.

Type in the following

SHIFT RETURN P*HELP|M SHIFT RETURN X

The line above will display the operating system and language ROMs version numbers:

Save the frame to disc using a suitable filename, *and note that the command disappears from the screen.*

Press **CTRL BREAK** and reload the Prestel software by typing

*PRESTEL RETURN

Now reload the frame you saved, using the **LOAD FRAME** key. Notice that all you see is the text you keyed in after the command.

Press the **MENU** key, and the *HELP information should appear on the screen.

Try programming one or more of the function keys, using a number rather than a *. Remember that the function keys will not contain the strings you have programmed them with *until* you use the **MENU** key.

Lengthy command strings

Command strings which make more than one line must always start each new line with **SHIFT RETURN P**, and finish with **SHIFT RETURN X** only at the end of the final line.

Inserting Prestel commands

Prestel commands can be inserted into these command strings. Function key numbers **f0** to **f9** are typed into the command string as |F0 to |F9 and **SHIFT f0** to **SHIFT f9** are typed in as |F@ |FA |FB to |FI. For example:

Start command	CALL	Pause (see below)	User password
Program function key 0	Telephone number of Enterprise computer		End command
		User ID	

Once this has been loaded from disc, and the **MENU** key pressed, the string can be executed by function key 0 (**CTRL f0**). The concealed state of the command is of great use here for security reasons.

Any number of commands may be stored on a frame, and executed by using the **MENU** key. Because you can include text in the frame, the commands concealed in the frame can be documented. For example, you could produce a frame which programs the function keys, and include a text description of their programmed functions.

Allowing a pause for connection **PAUSE (SHIFT f2)**

When calling the Prestel computer automatically (see above example), a time delay must be inserted after the number has been dialled to allow for connection. The **PAUSE** key provides a delay for this, and causes the Adapter to wait for a frame to be received before proceeding with the execution of the remainder of the current command line.

6 Configuration commands

The Prestel Adapter has a number of default settings which may be changed. These settings and how to change them are listed in this chapter. Please note that no reconfiguration should be attempted unless you are fully aware of the consequences.

All Prestel Adapter reconfiguration is via the **CONFIG** command (**SHIFT f1** or |FA).

When the function is selected, a query (?) is displayed, after which the user enters two parameters as follows:

? x , y **RETURN**

where x is the number of the configuration attribute to be changed, with a value between 0 and 71, and y is the new configuration attribute value, between 0 and 255.

For example, the following will change the state of the Adapter's on-line/off-line status flag to indicate on-line:

? 71,1 **RETURN**

Badly formatted or out-of-range commands are rejected with the message '?' (error #20 – see chapter 8).

Disc and Econet users may wish to prepare a 'boot' file which automatically generates the required configuration commands. When BUILDing such a file in `MODE 7`, the "red" character normally obtainable via **SHIFT f1**, followed by A, followed by the pair of configuration parameters should be entered and followed by a **RETURN** for each required command. For example, a typical 'boot' file might appear as:

```
0001      *PRESTEL
0002      ^A37,32          ^ equivalent to SHIFT f1
0003      ^3
0004      01-686-0311
0005      ^B1234567890ABCD
```

and lines 2, 3 and 5 appear in red. In this file, line 1 selects the Prestel system, line 2 allots an extra 8K of memory for buffers, line 3 selects the Call function, line 4 enters the telephone number and line 5 uses the Pause function to wait for a connection and then enters the user's ID and password.

Keyboard interface

?0 Function key alias character (default ?0,6)

In order to make terminal functions accessible to function key strings, the sequence |Fn (**CTRL** F,n), where n is a digit (0 ... 9), or a 'letter' (@,A Z), will normally invoke function key (0 ... 9) or **SHIFT** function key (0 . 9).

For example, to program the use and confirmation of the Call function into function key 8, and the Hold function into function key 9:

```
*KEY8      | F3|M01-686-0311|M
```

```
*KEY9,      | FD|M
```

If a different alias character is required, use ?0,<ASCII code>.

Note: If a filing system does not allow the insertion of control codes into BUILD/EXEC files, then **SHIFT** f1 (red) can be used as an alias. For example, in an EXEC file

SHIFT f1 9 **RETURN**

would invoke and confirm the Print function **f9** Also, **SHIFT** **f0** (white/ nothing) is an alias for **CTRL** _, eg (white) <- = ESC, &1B.

Telesoftware

?1 Telesoftware decoder type (default ?1,1)

This should no longer be required, but allows switching between 'old BBC' (decoder 0) and 'strict CET' (decoder 1) decoding. All 'old BBC' telesoftware on Prestel should have been removed by the end of August 1983. Some telesoftware programs on Prestel may be in the old format, in which case you will need to change ?1,1 to ?1,0.

?2 Maximum decoder retries (default ?2,3)

Controls the number of times a corrupted telesoftware block will be automatically re-requested, before the user is asked to continue or escape from the download.

?3 (reserved)

Reserved for configuration of external software.

?4 Filing system type (default ?4,0)

Controls the use of OSBPUT (if filing system type is 0) or OSGBPB (if FS type is not 0) in ongoing block-save of downloaded file when memory is full.

Disc and E conet users should (but needn't) select ?4,1 in order to speed up this type of file save.

?5 Download buffer lower limit (default ?5,OSHWM)

Controls the lower limit of the telesoftware download buffer memory space. Normally set to default `PAGE` at OSHWM, as read by `*FX131`. The value is a 'page' number expressed in decimal form.

For example, to set the limit to `&0E00` (page `&0E`), type

?5,14 RETURN

?6 Download buffer upper limit (default ?6,HIMEM)

Controls the upper limit of the telesoftware download buffer memory space. Normally set to default `HIMEM` at the base of the screen memory space, as read by `*F X132`. The value is a 'page' number expressed in decimal form.

For example, to set the limit to `&7C00` (page `&7C`), type

?6,124 RETURN

Note: If extra RS423 input buffering is selected (via ?37,n), then the space available to downloading will be reduced by 'n' 256-byte pages.

Communications

?7 RS423 receive rate code (default ?7,4)

Controls the receive rate of the RS423 interface. Normally rate code 4 for 1200 baud reception.

?8 RS423 transmit rate code (default ?8,1)

Controls the transmit rate of the RS423 interface. Normally rate code 1 for 75 baud transmission.

?9 Receive parity type (default ?9,2) and**?10 Transmit parity type (default ?10,2)**

Control the receive and transmit parity checking, as follows:

- 0 – no parity applied or checked
- 1 – odd parity
- 2 – even parity

Timers

?11 Transmit delay (LSB) (default ?11,15) and

?12 Transmit delay (MSB) (default ?12,0)

Control the minimum delay period between character transmissions. The BBC Microcomputer 'counts' in hundredths of a second, so ? 11,15 means a transmit delay of 150mS.

?13 Receive delay (LSB) (default ?13,15) and

?14 Receive delay (MSB) (default ?14,0)

Control the maximum expected delay between consecutively received characters. Determines frame timeout period in conjunction with ?15 and ?16.

?15 Response delay (LSB) (default ?15,4) and

?16 Response delay (MSB) (default ?16,1)

Control maximum expected delay between transmission of character and reception of reply, including database seek time. Determines frame timeout period in conjunction with ?13 and ?14.

?17 and ?18 (reserved)

Reserved as an independent 16-bit timer for use by external software.

?19 Logoff delay (LSB) (default ?19,96) and

?20 Logoff delay (MSB) (default ?20,234)

Control the period of terminal inactivity after which the Adapter will be automatically disconnected. Normally 60,000cS or 10 minutes.

?21, ?22, ?23, ?24 (reserved)

Reserved for 'transient' delays, used by various timed terminal functions. May be used by external software when not otherwise in use.

Transient delays

The following delays are used to load the timers configurable via ?21 to ?24 during the course of various timed functions.

Caution: The following set of delays (?25 ... 34) are configurable only in order to fine-tune the software to the requirements of the Prestel Terminal Specification. *Do not attempt to change these from their default values, or the Prestel Adapter will no longer meet the British Telecom requirements.*

**?25 Pre-dial delay (LSB) (default ?25,144) and
?26 Pre-dial delay (MSB) (default ?26,1)**

Control the delay between seizing the line and actually dialling. Normally 400cS or 4S.

**?27 Inter-digit delay (LSB) (default ?27,80) and
?28 Inter-digit delay (MSB) (default ?28,0)**

Control the inter-digit delay during dialling. Normally 80cS or 800mS.

**?29 Dropout test delay (LSB) (default ?29,60) and
?30 Dropout test delay (MSB) (default ?30,0)**

Control the delay before a carrier dropout test is abandoned with a `Disconnected` error. Normally 60cS or 600mS.

**?31 Carrier-test delay (LSB) (default ?31,200) and
?32 Carrier-test delay (MSB) (default ?32,0)**

Control the duration of the carrier detect test during the `Call` function. Normally 200cS or 2S.

**?33 Reply delay (LSB) (default ?33,40) and
?34 Reply delay (MSB) (default ?34,35)**

Control the delay before the `Call` function is abandoned with `No reply` error. Normally 9000cS or 90S.

Frame sending

?35 Frame send type (default ?35,1)

Controls the action of the `Send` function when sending a complete frame to the Prestel editor or similar (see also ?69). When ?35,1 (default) is selected, the entire contents of each frame line are sent, including trailing spaces. If ?35,0 is selected, trailing spaces are not sent, and are replaced by carriage return, line feed sequences. The second option is obviously faster, but the original frame into which the data is being sent should be empty.

Error handling

?36 Error action (default ?36,1)

Controls the closing of files after a 'fatal' error condition (BRK). When ?36,1 (default) is selected, any open files are closed when a BRK occurs, the intention being that EXEC (and SPOOL) files should be closed on error. If ?36,0 is selected then open files are not closed (except that a telesoftware 'open file' will be closed if open). If closing all files causes a *further* error (as may occur under the Net filing system), then only the *original* error is reported, and the option is then automatically reset to ?36,0 to prevent further occurrences. The user may subsequently set the option again if required.

Remote input buffering

?37 Buffer pages (default ?37,0)

Controls the number of 256-byte 'pages' of memory allocated to extra RS423 input buffering. If zero (default), then no extra buffering is applied. If non-zero, then the specified number of pages are used as an additional remote input buffer. When the terminal is being used via the Econet REMOTE facility, at least 8Kbytes of buffering should be allocated, via ?37,32. Buffer space is allocated from the 'download buffer upper limit' downwards (see ?6), and so reduces the space available for telesoftware buffering.

Call characteristics

?38 Call transmit character (default ?38,0)

If non-zero, then the specified character code is transmitted repeatedly (at response time intervals – see ?15 and ?16) by the Call function, as soon as carrier has been detected, until the character specified by ?39 is received. If zero (default for Prestel), then no character is transmitted. This may be required when calling non-Prestel services in order to 'wake up' the remote computer. For example, to transmit carriage returns until a reply is received, ?38,13 would be used.

Note: BT Gold users should use the default value ?38,0.

?39 Call receive character (default ?39,12)

If non-zero, then the Call function waits for the specified character code to be received before the terminal considers itself on-line– the default value waits for a clearscreen (&0C) character to be received from Prestel. If zero, then Call does not wait for a character to be received (nor is any character transmitted –

see ?38 above), and exits with the on-line flag set as soon as carrier is detected.

?40 Cursor state (default ?40,0)

Controls the state of the terminal's cursor on/off flag directly. Normally 0 (off) until the 'cursor on' character is received from Prestel, but it may be desirable to turn the cursor on (?40,1) when calling non-Prestel services, in order to obtain normal cursor-control key actions (see also ?42).

Note: BT Gold users should use ?40,1.

?41 Blob character (default ?41,31)

Select the keyboard character which generates the 'blob' (&7F) character. The default makes this character obtainable via **CTRL _** (&1F). If this code is required for communications with a non-Prestel service, then the 'blob' should be assigned to another key code.

?42 Return key action (default ?42,1)

Controls the action of the **RETURN** key. Because Prestel makes frequent use of the hash (#) character as a terminator, it is convenient to have the **RETURN** key generate this code (&5F), and the default of ?42,1 ensures that **RETURN** always generates a hash. With the default setting, the carriage-return code (&0D) can always be obtained via **CTRL RETURN**. If ?42,0 is selected, then the action of the **RETURN** key depends on the state of the cursor— when it is on (visible), **RETURN** generates &0D; when it is off (invisible), **RETURN** generates hash— note that the current help menu assumes that ?42,0 has been selected! The alternative code is obtained via **CTRL RETURN**. The following table summarises the above:

	CTRL		RETURN	
CONFIG	pressed?	Cursor	gives	
?42,0	No	Off	Hash	(&5F)
?42,0	No	On	Return	(&0D)
?42,0	Yes	Off	Return	(&0D)
?42,0	Yes	On	Hash	(&5F)
?42,1	No		Hash	(&5F)
?42,1	Yes		Return	(&0D)

The **RETURN** key always generates &0D during the Edit function.

Note: BT Gold users should use ?42,0.

Filing characteristics

?43 Filename length (default ?43,7)

Controls the filename length (not counting 'dot' extensions) assumed by the Save Program and Save Frame functions when generating filenames. Normally 7.

?44 Frame file type (default ?44,0)

Controls the size of file generated by the Save Frame function, and expected by the Load Frame function, as follows:

0 – 920-byte frame files

1 – 1024-byte frame files

Normally 0 for compact frame files. If 1 then the frame image is preceded by 104 (68) bytes of unpredictable data! The larger file type is compatible with the Notting Dale ITeC LVS.

Printing characteristics

?45 Line-feed switch (default ?45,0)

Controls whether or not line-feed characters (&0A) are sent to the printer (FX6 cannot be used here). Normally 0 for no line-feed sent. Any other value sends line-feeds.

?46 Space suppression switch (default ?46,1)

Controls whether or not trailing spaces are sent to the printer. Normally 1 to send trailing spaces. 0 will suppress.

?47 Graphics replacement character (default ?47,42)

Controls the character printed in place of block graphics characters. Normally 42 to print * in place of graphics. 0 will cause graphics characters to be sent to the printer (albeit converted in some way – see below).

?48 Low graphics base (default ?48,160) and

?49 High graphics base (default ?49,192)

Controls the range of character codes output to the printer to represent block graphics characters. Only applicable if ?47,0 has been selected. Normally 160 and 192.

?50 Attribute replacement character (default ?50,32)

Controls the character output to the printer to replace graphics attribute codes. Normally 32 to replace attribute characters with spaces. 0 will output attributes as codes in the range &80 to &9F.

?51 Page depth (default ?51,66)

Controls the number of lines assumed per printer page. Normally 66 for a standard 11-inch page, 1/6-inch feed.

?52 to ?67 Printer character code conversion

?52 Input character 1
 ?53 Output character 1
 ?54 Input character 2
 ?55 Output character 2
 ?56 Input character 3
 ?57 Output character 3
 ?58 Input character 4
 ?59 Output character 4
 ?60 Input character 5
 ?61 Output character 5
 ?62 Input character 6
 ?63 Output character 6
 ?64 Input character 7
 ?65 Output character 7
 ?66 Input character 8
 ?67 Output character 8

Control the conversion of up to eight individual display character codes on output to the printer. The codes are arranged as eight pairs, the first of each pair being the input character to be converted and the second being the replacement output code. Any pair whose first code is zero is ignored. The initial configuration is for the JP101 printer and is as follows.

1 — 'back arrow' (&5B)	replaced by 'left broken bracket' (&3C)
2 — 'half' (&5C)	replaced by 'space' (&20)
3 — 'forward arrow' (&5D)	replaced by 'right broken bracket' (&3E)
4 — 'hash' (&5F)	replaced by 'plus' (&2B)
5 — 'underline' (&60)	replaced by 'underline' (&5F)
6 — 'quarter' (&7B)	replaced by 'space' (&20)
7 — 'three quarter' (&7D)	replaced by 'space' (&20)
8 — 'blob' (&7F)	replaced by 'space' (&20)

Miscellaneous options

?68 Line check switch (default ?68,1)

Controls the continuous monitoring (by checking RS423 CTS) of the state of connection when on-line. Normally 1 for continuous monitoring. 0 switches monitoring off.

?69 Send type (default ?69,0)

Controls the action of the Send function, either to send the current frame contents complete (to the Prestel on-line editor or similar), or to send it as a multi-field message or response frame. The default setting allows the cursor position at the time of selecting Send to select the action type— if the cursor is at position (0,1) the frame will be sent complete, otherwise it will be sent as a message. ?69,1 forces the frame to be sent as a message. ?69,2 forces the frame to be sent complete.

?70 * command alias character (default ?70,255)

Selects the normal keyboard character which invokes the * command function. Normally set to an unavailable value. ?70,42 will select * as the * command alias character.

?71 Terminal status (default ?71,255)

Controls the state of the terminal's on-line/off-line flag directly. The initial 'don't know' value of 255 is resolved into 0 = off-line or 1 = on-line by a startup line test.

7 Assembly language programming

The Prestel ROM contains several service facilities which may be called from other languages by the use of an OSWORD call (see the *BBC Microcomputer System User Guide* chapter 43 for a description of this call). The service facilities provided allow the Prestel Adapter auto-dialler and modem to be used from user programs written in other languages (eg BASIC).

All the service facilities are provided by the same OSWORD call with A = &7B. OSWORD is called at address &FFF1 and indirects through &20C. Before calling the OSWORD routine the X and Y registers should be set to contain the low and high bytes respectively of the address of a single byte parameter block. The parameter block must contain a byte in the range 0 to 5, thus providing six service calls – RESET, STEP, PULSE, START-DIGIT, END-DIGIT and DCD-CHECK.

The Prestel Adapter can be set on-hook (ie disconnected from the telephone) at any time by use of the RESET call. The STEP call is used to step the Adapter sequentially through a series of pre-determined states (each STEP call will cause the Adapter to move to the next state). A RESET call will return the Adapter to state 0 at any time.

State 0

The Adapter is on-hook with the loudspeaker switched off and the modem disabled. This is the default state and will be selected after power-up and whenever the **BREAK** key is pressed. In state 0 the DCD-CHECK call will indicate if the Adapter is correctly connected and the power is turned on. A delay of four seconds must be completed before proceeding to state 1 in order to ensure clearance of any previous call attempt by the telephone exchange.

State 1

The Adapter is off-hook, the loudspeaker is switched on and the modem is disabled. This state can be used to prompt the user for detection of an audible dialling tone. If a dialling tone is not detected after 90 seconds, a RESET call must be made to return the Adapter to state 0. If automatically proceeding to state 2, a delay of four seconds must be completed before proceeding in order to allow the telephone exchange to detect your call.

State 2

The Adapter is off-hook, the loudspeaker is switched off and the modem is disabled. This state can be used for dialling a telephone number utilising the START-DIGIT, PULSE and END-DIGIT calls. A pause of between 800 and 900 milliseconds must be completed before dialling each digit. Upon completion of dialling you should proceed to state 3.

State 3

The Adapter is off-hook, the loudspeaker is on and the modem is disabled. This state allows the user to listen to the call progress and to hear carrier when the remote service replies. The DCD-CHECK call should be used in this state to detect two seconds of continuous carrier before proceeding to state 4. If two seconds of continuous carrier are not detected within 90 seconds of completion of dialling, a RESET call must be made to return the Adapter to state 0 and terminate the call.

State 4

The Adapter is off-hook, the loudspeaker is off and the modem is enabled. Transmission and reception of data can occur in this state. Regular DCD-CHECK calls must be made to ensure continuous reception of carrier signal from the remote modem. If carrier is not detected for a period of more than 400 milliseconds, the call must be cleared with a RESET call. Data should be transmitted at 75 baud and received at 1200 baud via the RS423 port in this state.

The DCD-CHECK call is used for two purposes. When the Adapter is on-hook the call will test that the Adapter is connected and powered by returning a 'carrier present' indication. When the Adapter is off-hook the DCD-CHECK will return 'carrier present' or 'carrier absent' according to the state of the carrier detect output from the modem.

Three calls are used to control dialling. START-DIGIT must be called immediately prior to dialling a digit and END-DIGIT must be called immediately after dialling a digit. PULSE is used to dial the digit itself — for example to dial the digit '7' PULSE must be called seven times. Note that ten PULSE calls must be made to dial the digit '0'.

The various calls described above are summarised below:

Call name	Parameter byte	Return byte	Description
RESET	&00	None	Force Adapter to state 0 irrespective of the current state.
STEP	&01	None	Force Adapter to next sequential state (do not use in state 4).
PULSE	&02	None	Cause a dial pulse and inter-pulse delay (use only in state 2).
START-DIGIT	&03	None	Initialise Adapter to dial one digit (use only in state 2).
END-DIGIT	&04	None	Terminate after dialling one digit (use only in state 2).
DCD-CHECK	&05	DCD	The return byte is placed in the parameter byte and overwrites the calling parameter. A '0' indicates that the Adapter is unpowered or not connected correctly if the Adapter is in state 0, otherwise that carrier is not present. A '1' indicates that the unit is powered if the Adapter is in state 0, otherwise that carrier is being received from the remote computer.

8 Error messages

Fatal and non-fatal errors

There are two types of error message produced, 'fatal' and 'non-fatal'.

Non-fatal errors are all generated by the Download function. This means that an escape from the condition is at the user's discretion. They are not caused by software BRKs, and hence are untrappable. If the function is being invoked by a keystring or an EXEC file, or by external software, these errors should be accounted for by:

- Increasing the automatic retry count (?2,n) to a high value.
- Following the Download function by two extra **RETURN** codes to ensure that any invocation of an 'ongoing' Save Program function is confirmed.

For example:

```
... |FA2,255|M... |F5|M|M|M|M...
```

When a fatal error occurs, the current function is abandoned, all buffers are flushed and any open files are closed. All fatal error messages are issued as a result of software BRKs (error numbers are specified with each error message in the list below). These errors are trappable via BRKV.

Non-fatal errors

Data?

Indicates that corruption of the current telesoftware block has been detected—this message is displayed immediately before requesting retransmission of the block. If the block is not received correctly within three retries (default), then this message is displayed, and the user is invited to escape from, or continue with, the download.

No room

Indicates that the buffer space allocated to telesoftware downloading (default is BASIC PAGE to HIMEM) has been filled. The user is automatically offered the option of saving the file in 'ongoing' mode (an incremental version of the Save Program function), otherwise the download can be escaped.

Fatal errors

No reply 11

No reply to the Call function was received within a specific time (default 90S).

(Try again, perhaps with a different number.)

If trying to call a non-Prestel system, make sure ?38,c and ?39,c have been set appropriately, otherwise Call will wait for a clearsreen character to be received.

Block count 12

The actual and expected number of telesoftware blocks received don't match

(The file can still be saved, but one or more blocks may have been missed.)

Block seq 14

Either a telesoftware block has been skipped, or the next block cannot be found. (Repeat download or contact British Telecom.)

Can't open/extend 15

Unable to open or extend the output file when saving a telesoftware file in 'ongoing' mode.

(Correct filing problem and repeat download – as some programs are chargeable, it is a good idea to ensure that sufficient filing system space is available before downloading large programs.)

Escape (not reported) 17

Escape key pressed. Although this error does not display a message or cause a `bleep' , all other side- effects of the BRK occur.

Disconnected 18

The current connection has been accidentally lost, *or* the user has 'left' Prestel other than via the Leave or Hold functions, *or* the connection has been broken automatically by the terminal software, after a specific period (default ten minutes) of no activity.

(Call again if required.)

Note that the terminal will *not* disconnect automatically if another language (eg BASIC) is selected whilst on-line — the Online banner is left on display as a warning to this effect.

O'flow 19

Internal keyboard stack, or extra remote input buffer, overflow has occurred. The keyboard stack should never overflow in practice. If extra remote input buffering is selected (by ?37,n), then any overflow of the buffer will cause this error.

(If ?37 has been used to select extra buffering, increasing the number of reserved pages — ?37,32 (8K) is recommended.)

? 20

An invalid configuration command has been entered.

(Try again.)

Adapter? 21

Indicates that the Prestel Adapter is not switched on or not connected to the computer.

(Connect, switch on and try again.)

Other fatal errors

Any other errors concerning the operating system or current filing system are reported with the standard messages and error numbers, and cause the usual BRK side-effects.

Appendix A

Fitting the Prestel ROM

First of all, disconnect your BBC Microcomputer from the mains supply. You should insert the Prestel ROM into one of the free ROM sockets which are located on the front right-hand side of the circuit board inside the BBC Microcomputer casing. Please refer to figure 2 at the end of this Appendix.

1. To get to the board, undo the four screws which hold the casing together— on some computers these will be marked 'FIX'. Two of these screws are underneath the computer, and the other two can be found on the back.
2. Once the top is removed, release the bolts holding down the keyboard assembly. These are located on either side of the keyboard. Some machines have two bolts, others may have three.
3. There is no need to disconnect the keyboard completely, so the multi-wire connector to the main board can be left in place. Carefully displace the keyboard, rotating it clockwise through about 20 degrees so that the front right-hand side is accessible.
4. Locate the row of five large sockets. The one on the left contains the operating system. If you have the BASIC language in your BBC Microcomputer, then the BASIC ROM will be in one of the other four sockets, and if you have a filing system other than cassette, then one or more sockets will contain the relevant filing system ROM(s).

Language and filing system ROMs - operating procedure

The four ROM sockets have an operating priority, decreasing from right to left. On a hard reset, or when the computer is switched on, the language ROM in the rightmost ROM socket takes priority over the others. Similarly, the filing system ROM in the rightmost position takes priority over any other filing system. So the position of the Prestel ROM in relation to any other languages present will determine whether your machine starts up as a Prestel terminal or in another language (eg BASIC).

Inserting the Prestel ROM

1. Before taking the ROM out of its protective packaging, identify Pin 1 on the ROM. It is either marked with a dot on the top, in the corner of Pin 1, or the half-moon notch at one end of the ROM identifies the end of the ROM nearest Pin 1. Pin 1 should be on the left if the notch is held up.
2. Hold the ends of the ROM between finger and thumb, and line up all the pins over the destination socket. Pin 1 and the half-moon notch should point towards the back of the computer casing.
3. Now apply firm pressure to the ROM, but try not to force it! When the ROM is in, it appears to be slightly raised. Check that all the pins do enter the socket, and that none are bent out or underneath.

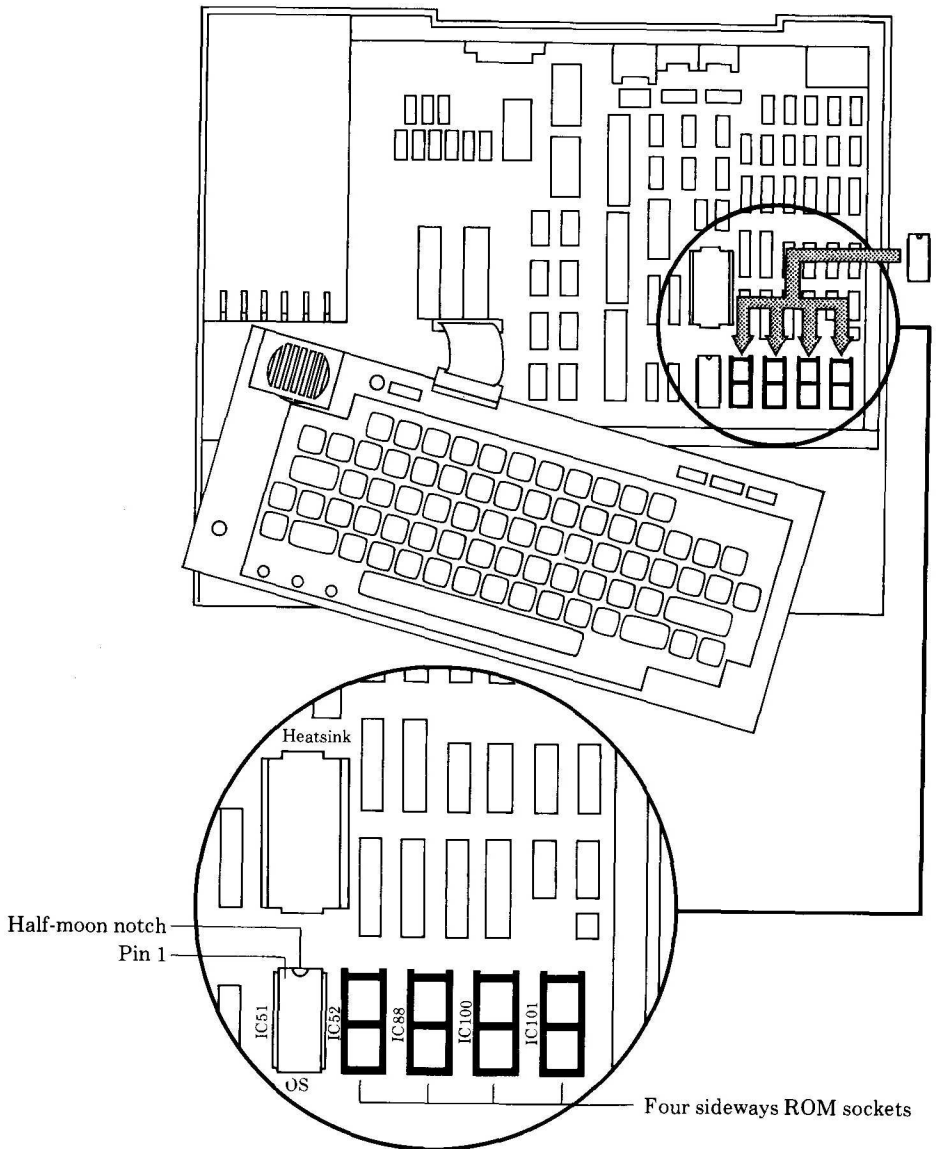
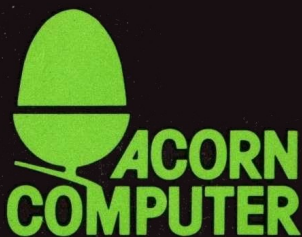


Figure 2 Inserting the Prestel ROM



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